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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/635,404	08/06/2003	Johnny Chung Lee	MERL-1491	8478

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Patent Department
Mitsubishi Electric Research Laboratories, Inc.
201 Broadway
Cambridge, MA 02139

EXAMINER

KOVAL, MELISSA J

ART UNIT	PAPER NUMBER
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2851

DATE MAILED: 02/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/635,404

Applicant(s)

LEE ET AL.

Examiner

Melissa J Koval

Art Unit

2851

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-12,14,15,17-20,22,23 and 26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3,13,16,21,24 and 25 is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 8/03 & 11/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

Applicant should note that one reference on the Information Disclosure Statement was not considered and has been lined through by the examiner. This is the finally listed reference, "U.S. Patent 5,753,758" to Woo. The patent number given is incorrect. Applicant is requested to provide an Information Disclosure Statement with the correct information listed in response to this office action.

The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 4-11, 14, 15, 17-20, 22, 23, and 26 are rejected under 35 U.S.C. 102(e) as being anticipated by Surati et al. U.S. Patent 6,456,339 B1.

Claim 1 sets forth: "A method for determining correspondence between locations on a display surface having an arbitrary shape and pixels in an output image of a projector, comprising (See the SUMMARY OF THE INVENTION, particularly column 6, lines 26 through 46, and column 7, lines 14 and 15. Method steps are shown in the flowcharts of Figures 4A, 4B, 5, 6 and 7, for example.):

projecting a set of known calibration patterns onto the display surface (See column 7, lines 10 through 13. See column 8, lines 52 through 64. See column 11, lines 4 through 25.);

sensing directly an intensity of light at each of a plurality of locations on the display surface for each calibration pattern, there being one discrete optical sensor associated with each location; and correlating the intensities at the locations to determine correspondences between the plurality of locations and pixels in an output image of the projector (See column 7, lines 1 through 9. See column 21, lines 49 through 67, and column 22, lines 1 through 14. Furthermore, in the discussion of "Warping the Image to be Positionally Seamless" beginning in column 15, line 5, and ending in column 16, line 17, a discussion of mapping with discrete input and output values and discrete sampling is given.)."

Claim 2 sets forth: "The method of claim 1, in which each location has known coordinates (See column 15, lines 6 through 45.)."

Claim 4 sets forth: "The method of claim 1, in which the correspondences are used to determine parameters of the projector." See column 11, lines 4 through 25, and column 13, lines 42 through 67, as examples.

Claim 5 sets forth: "The method of claim 4, in which the parameters include internal and external parameters and non-linear distortions of the projector." Again refer to column 11, lines 4 through 25.

Claim 6 sets forth: "The method of claim 1, further comprising:
warping an input image to the projector according to the correspondences; and
projecting the warped input image on the display surface to appear undistorted."
See column 11, lines 36 through 42.

Claim 7 sets forth: "The method of claim 1, in which the projector is casually aligned with the planar display surface." See Figure 1 and any of projectors P_1 through P_4 .

With respect to claims 8 and 9, refer to column 7, lines 14 and 15.

Claim 10 sets forth: "The method of claim 1, in which a viewer and the projector are on a same side of the display surface." Column 22, lines 21 through 29.

Claim 11 sets forth: "The method of claim 8, in which the display surface is planar and a number of locations is four." See Figure 10 and column 15, lines 57 through 65.

Claim 14 sets forth: "The method of claim 1, in which the intensity is quantized to zero or one." See the term "discrete output values" in column 15, lines 54 and 55, for example. Also see Figure 6.

Claim 15 is rejected for the same reasons already applied to rejected claim 6.

Also see column 10, lines 56 through 67, and column 11, lines 1 through 3.

Claims 17 and 18 are met by the teaching of column 7, lines 14 and 15.

Claim 19 sets forth: "The method of claim 1, in which the light is infrared." See column 7, lines 1 and 3, and column 13, lines 55 through 60.

Claim 20 sets forth: "The method of claim 1, in which each calibration image is projected as a pair, a second image of the pair being an inverse of the calibration image." See Figures 11A and 11C. See column 15, lines 33 through 45. See column 16, lines 19 through 55.

Claim 22 is rejected for the same reasons already applied to rejected claims 1 and 6.

Claims 23 and 26 are rejected for the same reasons applied to already rejected claim 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Surati et al. U.S. Patent 6,456,339 B1.

Surati et al. '339 B1 teaches all of the elements of claim 12, except that

Surati et al. '339 B1 do not say specifically what type of components comprise the sensors which are used for the optical sensors comprising their super-resolution display. However, throughout the specification of '339 B1, it is made clear that a variety of optical sensors maybe be used in various embodiments taught therein. The type of optical sensor used does not distinguish the invention over the prior art of record. Applicant does not teach in his specification the criticality of using a photo transistor over another type of sensor and the results of using one optical sensor in place of another are not unexpected.

Transistors, by definition, may carry a voltage that can hold a discrete value.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to use an optical sensor that can sense visible light such as a photo transistor. The motivation for one having ordinary skill in the art to make such a selection would be the use of an optical sensor compatible with discrete intensities.

Allowable Subject Matter

Claims 3, 13, 16, 21, 24 and 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record neither shows nor suggests a method comprising all of the steps of claim 3 in combination and particularly making use of calibration patterns in the form of Gray codes.

The prior art of record neither shows nor suggests a method comprising all of the steps of claims 13 and 24 wherein the optical sensor is coupled to a corresponding location by means of an optical fiber.

The prior art of record neither shows nor suggests a method comprising all of the steps of claim 16 in combination and particularly wherein the display surface and the projector are moving with respect to each other.

Each and every limitation of claims 16 and 21 render the respective claims allowable over the prior art of record.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bradski et al. U.S. Patent 6,768,509 B1 teaches a method and apparatus for determining points of interest on an image of a camera calibration object.

Nishikori et al. U.S. Patent 6,832,825 B1 teach a test pattern printing method, information processing apparatus, printing apparatus and density variation correction method.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melissa J Koval whose telephone number is (571) 272-2121. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on (571)272-2258. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MJK

A handwritten signature in black ink, appearing to read "Melissa Jan Koval". The signature is stylized with a large, looped initial "M" and a long, sweeping horizontal line extending to the right.